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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,961	04/02/2004	Lorand D'Ouvenou	071308.0545	1695

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EXAMINER


DOUGHERTY, THOMAS M

ART UNIT PAPER NUMBER

2834

DATE MAILED: 07/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/816,961	Applicant(s) D'OUVENOU, LORAND	
	Examiner Thomas M. Dougherty	Art Unit 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Remarks

A review of the art of record and subsequent search has resulted in new art being applied to the claimed invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-9, 12, 14 and 15 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Val (FR 2 554 516). Val shows (figs. 5B, 5C) an actuator unit comprising at least two actuator elements (50, 59) which when electrically activated each experience a change in length, which are connected to a control device (e.g. spring in fig. 5b, piston, 80, in fig. 5c) by means of an interactive connection (77-79), and an actuator housing (6) which encloses the actuator elements (50, 59) and which is connected to the actuator elements by means of a positive and/or friction fit, where when activated the at least two actuator elements generate approximately the same kinetic energy in opposite directions.

A first (50) and a second (59) actuator element are disposed essentially opposite each other with intersecting longitudinal axes. Note the intersection is direct.

A vector sum of the longitudinal movements of the at least two actuator elements (50, 59) is approximately zero at any given time.

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A first (50) and a second (59) actuator element are disposed opposite each other with coincident longitudinal axes.

A first and a second end face of the first (50) and second (59) actuator element respectively are supported in the actuator housing (6), and a third and fourth end face of the actuator elements (50, 59) respectively act upon a transmission medium (77-79).

The transmission medium (77-79) is part of a transmission device and acts upon the control device (e.g. spring in fig. 5b, piston, 80, in fig. 5c).

The transmission medium (78, 79) is part of a hydraulic transmission device (fig. 5c) and acts upon the control device (80).

The direction of the axial movements of the first (50) and second (59) actuator elements is oriented essentially normal to the direction of movement of the control device (e.g. spring in fig. 5b, piston, 80, in fig. 5c).

Each of the actuator elements (50, 59) is a piezoelectric actuator element.

The actuator unit can be an actuator of a fuel injection valve. Note however that this is a goal of the invention. As Val shows the claimed structural features of the invention he is regarded as reading on this goal. Note that it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Masham 2 USPQ2d 1647 (1987).

Each of the actuator elements (50, 59) of the actuator unit can be controlled separately from each other and individually. Note that all this requires is two actuation sources. The claim is not presented definitively that two such sources exist.

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Additionally, this claim seems to contradict claim 1 which indicates that the actuator elements are simultaneously activated.

Claim 10 is rejected under 35 U.S.C. 102(b) as being anticipated by Val (FR 2 554 516). Given the invention of Val as noted above, he further shows the first and second end face of the first and second actuator element respectively (50, 59) is supported in the actuator housing (6) and the third end face of the first actuator element (50) acts directly or indirectly upon the control device. Note in figures 5b and 5c that all end surfaces of the two actuators are within the housing, therefore the first and second ends of the first and second actuators respectively are thus within the housing. The third end face of the first actuator (which is simply its other end, not its already defined first end), though in the housing, acts directly or indirectly on the control device, e.g. the spring in fig. 5b or the piston in fig. 5c.

Claim 1, 10-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Sager et al. (US 5,798,600). Sager et al. show (figs 7, 11) an actuator unit comprising at least two actuator elements (40) which when electrically activated each experience a change in length, which are connected to a control device (54) by means of an interactive connection (56), and an actuator housing (understood, for example see fig. 11) which encloses the actuator elements (40) and which is connected to the actuator elements (40) by means of a positive and/or friction fit, wherein when activated the at least two actuator elements generate approximately the same kinetic energy in opposite directions. Note that the expansion of a unit cell in Sager et al. meets this requirement.

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Sager et al. further show the first and second end face of the first and second actuator element respectively (40) is supported in the actuator housing (not numbered but see fig. 11, et al.) and the third end face of the first actuator element (40) acts directly or indirectly upon the control device. Note in figure 11 for example that each piezoelectric unit cell is a stacked arrangement of two elements which expand in opposing directions. The end faces of these elements, which are in fact the top and bottoms of the elements are vertically arranged and all in the housing. A top surface of the element directly pushes the piston element (for example, see 56 in fig. 7).

Sager et al. show (fig. 7) directions of axial movements of first and second actuator elements (40) and as well as the direction of movement of a control device (56) oriented in each case axially parallel to one another.

Each of the actuator elements (40) is a piezoelectric actuator element.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Val (FR 2 554 516) in view of O'Neill (US 3,827,409). Given the invention of Val as noted above, he does not note use of magnetostrictive actuator elements.

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O'Neill teaches interchangeability of piezoelectric and magnetostrictive actuator elements at col. 4, lines 39-53.

O'Neill doesn't show opposing actuators generating the same kinetic energy in opposite directions.


It would have been obvious to use magnetostrictive actuators for the actuators in the device of Val at the time of his invention because as O'Neill notes this material can be used to drive an element, such as a piston, for use for example in valves.

Additionally, it would have been obvious to one having ordinary skill in the art to employ magnetostrictive actuator elements in the device of Val at the time of his invention, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Direct inquiry to Examiner Dougherty at (571) 272-2022.

tmd
tmd

July 13, 2005


TOM DOUGHERTY
PRIMARY EXAMINER